IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Anticipated Classification of this application:
Class _____ Subclass _____
Prior application: 08/485,113
Examiner: Woo, Stella
Art Unit: 2743

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

FILING UNDER 37 CFR 1.53(B)

This is a request for filing for a

☒ continuation   ☐ divisional

application under 37 C.F.R. 1.53(b) of pending prior application Serial No. 08/485,113, filed on June 7, 1995, which is a continuation of application Serial No. 08/306,751, filed on September 14, 1994, which is a continuation of application Serial No. 08/047,241, filed on April 13, 1993, now U.S. Patent No. 5,351,285, which is a continuation of application Serial No. 07/509,691, filed on April 16, 1990, now abandoned, and a continuation-in-part of application Serial No. 07/640,337, filed on January 11, 1991, now abandoned, which is a continuation of application Serial No. 07/335,923, filed on April 10, 1989, which is a continuation of application Serial No. 07/194,258, filed on May 16, 1988, now U.S. Patent No. 4,845,739, which is a continuation-in-part of application Serial No. 07/018,244, filed on February 24, 1987, now U.S. Patent No. 4,792,968, which is a continuation-in-part of application Serial No. 06/753,299, filed on July 10, 1985, now abandoned, said application Serial No. 07/509,691 is a continuation-in-part of application Serial No. 07/260,104, filed on October 20, 1988, now U.S. Patent No. 4,930,150, which is a continuation-in-part of application Serial No. 07/018,244, filed on Feburary 24, 1987, now U.S. Patent No. 4,792,968, which is a continuation-in-part of application Serial No. 06/753,299, filed on July 10, 1985, now abandoned, of

Ronald A. Katz

for: MULTIPLE FORMAT TELEPHONIC INTERFACE CONTROL SYSTEM

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1. **COPY OF PRIOR APPLICATION AS FILED WHICH IS ATTACHED**

☒ The attached specification and drawings are substantially the same as what is shown in our records to be the above-identified prior application, including the oath and declaration originally filed.

The papers of the attached application and accompanying copies of originally filed documents include:

   30   Pages of Specification
   5   Pages of Claims
   1   Pages of Abstract
   5   Sheets of Drawings   __formal   _X_ Informal
   2   Pages of Declaration and Petition to the principal attorney
   2   Page of Power of Attorney by Assignee from Aldo Tesi
   2   Pages of Power of Attorney by Assignee from Ronald A. Katz
   2   Pages of subsequent Revocation and Grant of Power of Attorney

☒ In accordance with the indication required by 37 CFR 1.53(b), my records reflect that the original signed declaration showing applicant's signature was filed on April 3, 1990.

☐ The amendment referred to in the declaration filed to complete the prior application, and I hereby state, in accordance with the requirements of 37 CFR 1.53(b), that this amendment did not introduce new matter therein.

2. **INCORPORATION BY REFERENCE**

The entire disclosure of the prior application, from which a copy of the original oath or declaration is supplied, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

3. **AMENDMENTS**

☒ Cancel in this application original Claims 2-17 of the prior application before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)

☐ A Preliminary Amendment is enclosed. (Claims added by Amendment must be numbered consecutively beginning with the number next following the highest numbered original claim in the prior application.)

4.   INFORMATION DISCLOSURE STATEMENT

☐   An Information Disclosure Statement, PTO 1449, and references are submitted herewith.

5.   PETITION FOR SUSPENSION OF PROSECUTION FOR THE TIME TO FILE AN AMENDMENT

☐   There is provided herewith a PETITION FOR SUSPENSION OF PROSECUTION FOR THE TIME NECESSARY TO FILE AN AMENDMENT (NEW APPLICATION FILED CONCURRENTLY).

6.   FEE CALCULATION (including claims presented in Preliminary Amendment)

BASIC FILING FEE:					$760.00
Total Claims	1	- 20	=	0 x $18	$0.00
Independent Claims	1	- 3	=	0 x $78	$0.00
Multiple Dependent Claims		$260 (if applicable)			
Surcharge 37 CFR 1.16(e)		$130 (if applicable)			
TOTAL OF ABOVE CALCULATIONS					$ 760.00
Reduction by ½ for Filing by Small Entity. Note 37 CFR 1.9, 1.27, 1.28. If applicable, Verified Statement must be attached.					
Misc. Filing Fees (Recordation of Assignment)					
TOTAL FEES SUBMITTED HEREWITH					$760.00

☐   The fee for extra claims is not being paid at this time.

Filing Fee Calculation

7.   SMALL ENTITY STATUS

☐   A Verified Statement to establish small entity under 37 CFR 1.9 and 1.27 is attached

☐   has been filed in the prior application and such status is still proper and desired. [37 CFR 1.28(a)]

Filing Fee Calculation (50% of above) $0.00

8.   DRAWINGS

[NOTE: DO NOT CHECK THIS IF PRIOR CASE IS NOT TO BE ABANDONED.]

☐ Transfer the drawings from the prior application to this application and, subject to Item 16 below, abandon said prior application as of the filing date accorded to this application. A duplicate copy of this request is enclosed for filing in the prior application file.

[May only be used if signed by (1) applicant, (2) assignee of record or (3) attorney or agent of record authorized by 37 CFR 1.138 and before payment of issue fee.]

☐ Transfer the following sheet(s) of drawings from the prior application to this application.

☒ New drawings are enclosed ☐ formal ☒ informal

9. PRIORITY - 35 U.S.C. 119

☐ Priority of application Serial No. _____ filed on _____ in _____ [country] is claimed under 35 U.S.C. 119.

☐ The certified copy has been filed in prior U.S. application Serial No. _____ on _____.

☐ The certified copy will follow.

10. RELATE BACK - 35 U.S.C. 120

☒ Amend the Specification by deleting on page 1, lines 5-15, and inserting under the heading "Related Subject Matter" as follows:

—This is a continuation of Application Serial No. 08/485,113, filed on June 7, 1995, which is a continuation of Application Serial No. 08/306,751 filed on September 14, 1994, and entitled "Multiple Format Telephonic Interface Control System," which is a continuation of Application Serial No. 08/047,241 filed on April 13, 1993, and entitled "Multiple Format Telephonic Interface Control System," now U.S. Patent No. 5,351,285, which is a continuation of Application Serial No. 07/509,691 filed on April 16, 1990, and entitled "Multiple Format Telephonic Interface Control System," now abandoned, and a continuation-in-part of Application Serial No. 07/640,337 filed on January 11, 1991, and entitled "Telephonic-Interface Statistical Analysis System", now abandoned, which is a continuation of Application Serial No. 07/335,923 filed on April 10, 1989, and entitled "Telephonic-Interface Statistical Analysis System," which is a continuation of Application Serial No. 07/194,258 filed on May 16, 1988, and entitled "Telephonic-Interface Statistical Analysis System," now U.S. Patent No. 4,845,739, which is a continuation-in-part of Application Serial No. 07/018,244 filed on February 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility," now U.S. Patent No. 4,792,968, which is a continuation-in-part of Application Serial No. 06/753,299 filed on July 10, 1985, and entitled "Statistical Analysis System For Use With Public Communication Facility;" now abandoned, said Application Serial. No. 07/509,691 is a continuation-in-part of Application Serial No. 07/260,104 filed on October 20, 1988, and entitled "Telephonic Interface Control System," now U.S. Patent No. 4,930,150, which is a continuation-in-part of Application Serial No. 07/018,244 filed on February 24, 1987, and entitled "Statistical Analysis System For Use With Public Communication Facility," now U.S. Patent No. 4,792,968, which is a continuation-in-part of Application Serial No. 06/753,299 filed on July 10,

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1985, and entitled "Statistical Analysis System For Use With Public Communication Facility," now abandoned.—

11. INVENTORSHIP STATEMENT

☒ With respect to the prior co-pending U.S. application from which this application claims benefit under 35 U.S.C. 120, the inventor(s) in this application is (are):

    ☒ the same

    ☐ less than those named in the prior application and it is requested that the following inventor(s) identified above for the prior application be deleted:

    [type name(s) of inventor(s) to be deleted]

☒ The inventorship for all the claims in this application are:

    ☒ the same

    ☐ not the same, and an explanation, including the ownership of the various claims at the time the last claimed invention was made, is submitted.

12. ASSIGNMENT

☒ The prior application is assigned of record to Ronald A. Katz Technology Licensing, L.P.

Ronald A. Katz Technology Licensing, L.P.
Name of Assignee

9200 Sunset Boulevard, Suite 1005, Los Angeles, California 90069
Address of Assignee

_____
Title of person authorized to sign on behalf of assignee

Assignment recorded in PTO on September 26, 1994, Reel 7133, Frames 090-100

☐ An Assignment of the invention to _____ is attached.

13. FEE PAYMENT BEING MADE AT THIS TIME

☐ Not attached. No filing fee is submitted. [This and the surcharge required by 37 CFR 1.16(e) can be paid subsequently.]

☒ Attached.

☒   Filing fee. $760.00

☐   Recording assignment. [**$40.00** 37 CFR 1.21(h)(1)]
Petition fee for filing by other than all the inventors or
person on behalf of the inventor where inventor refused
to sign or cannot be reached.
[**$130.00**; 37 CFR 1.47 and 1.17(h)]

☐   Petition fee to Suspend Prosecution for the Time
Necessary to File an Amendment (New Application Filed
Concurrently.
[**$130.00**; 37 CFR 1.103 and 1.17(i)(1)]

☐   For processing an application with a specification
in a non-English language.
[**$130.00**; 37 CFR 1.52(d) and 1.17(k)]

☐   Processing and retention fee.
[**$130.00**; 37 CFR 1.53(d) and 1.21(l)]

Total Fees Enclosed $760.00

14.   **METHOD OF PAYMENT OF FEES**

☐   Attached is a check in the amount of _____.

☒   Charge Deposit Account No. **12-2475** in the amount of $760.00.

15.   **AUTHORIZATION TO CHARGE ADDITIONAL FEES**

The Commissioner is hereby authorized to charge the following additional fees by this paper
and during the entire pendency of this application to Deposit Account No. **12-2475**:

☒   37 CFR 1.16 (filing fees)

☒   37 CFR 1.16 (presentation of extra claims)

☒   37 CFR 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date
later than the filing date of the application)

☐   37 CFR 1.17 (application processing fees)

☐   37 CFR 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37
CFR 1.311(b))

16.   INSTRUCTIONS AS TO OVERPAYMENT

☒   Credit Deposit Account No. **12-2475**.

☐   Refund

17.   POWER OF ATTORNEY

☐   The power of attorney in the prior application is to

☒   The power of attorney in the prior application is to the registered attorneys listed below and members of or associates in the law firm of **LYON & LYON LLP**, 633 West Fifth Street, 47th Floor, Los Angeles, California 90071, Registration No. 11,611, whose members are registered to practice in the U.S. Patent and Trademark office:

Roland N. Smoot, Reg. No. 18,718
Conrad R. Solum, Jr., Reg. No. 20,467
James W. Geriak, Reg. No. 20,233
Robert M. Taylor, Jr., Reg. No. 19,848
Samuel B. Stone, Reg. No. 19,297
Douglas E. Olson, Reg. No. 22,798
Robert E. Lyon, Reg. No. 24,171
Robert C. Weiss, Reg. No. 24,939
Richard E. Lyon, Jr., Reg. No. 26,300
John D. McConaghy, Reg. No. 26,733
William C. Steffin, Reg. No. 26,811
Coe A. Bloomberg, Reg. No. 26,605
J. Donald McCarthy, Reg. No. 25,119
John M. Benassi, Reg. No. 27,483
James J. Shalek, Reg. No. 29,749
Allan W. Jansen, Reg. No. 29,035
Robert W. Dickerson, Reg. No. 29,914
Roy L. Anderson, Reg. No. 30,240
David B. Murphy, Reg. No. 31,125

James C. Brooks, Reg. No. 29,898
Jeffrey M. Olson, Reg. No. 30,790
Steven D. Hemminger, Reg. No. 30,755
Jerrold B. Reilly, Reg. No. 32,293
Paul H. Meier, Reg. No. 32,274
John A. Rafter, Jr., Reg. No. 31,653
Kenneth H. Ohriner, Reg. No. 31, 646
Mary S. Consalvi, Reg. No. 32,212
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Robert C. Laurenson, Reg. No. 34,206
Carol A. Schneider, Reg. No. 34,923
Hope E. Melville, Reg. No. 34,874
Michael J. Wise, Reg. No. 34,047
Richard J. Warburg, Reg. No. 32,327
and
Reena Kuyper, Reg. No. 33,830

☒   The power appears in the original papers in the prior application.

☐   The power does not appear in the original papers, but was filed on _____ in this application.

☐   A new power has been executed and is attached.

☒   Address all future communications to:

> LYON & LYON LLP
> 633 West Fifth Street, 47th Floor
> Los Angeles, California 90071
> (213) 489–1600
> Attention: <u>Reena Kuyper</u>

18.   MAINTENANCE OF CO-PENDENCY OF PRIOR APPLICATION

☐   A petition, fee and response has been filed to extend the term in the pending **prior** application until _____. A copy of the petition for extension of time in the **prior** application is attached.

19.   CONDITIONAL PETITIONS FOR EXTENSION OF TIME IN PRIOR APPLICATION

☐   A conditional petition for extension of time is being filed in the pending **prior** application. A copy of the conditional petition for extension of time in the **prior** application is attached.

20.   ABANDONMENT OF PRIOR APPLICATION

☐   Please abandon the prior application at a time while the prior application is pending or when the petition for extension of time or to revive in that application is granted and when this application is granted a filing date so as to make this application co-pending with said prior application. At the same time, please add the words "now abandoned" to the amendment of the specification set forth in Item 13 above.

Respectfully submitted,

LYON & LYON LLP

Dated: _Nay 24, 1999_   By: _Reena Kuyper_

Reena Kuyper
Registration No. 33,830
Attorneys for Applicants

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Enclosures

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MULTIPLE FORMAT TELEPHONIC
INTERFACE CONTROL SYSTEM

Related Subject Matter

5   This is a continuation-in-part of Application
Serial No. 260,104 filed October 20, 1988 and entitled
"Telephonic Interface Control System". which is a
continuation-in-part of Application Serial No. 018,244
filed February 24, 1987 and entitled "Statistical
10   Analysis System For Use With Public Communication
Facility", now United States Patent No. 4,792,968, which
was a continuation-in-part of Application Serial No.
753,299 filed July 10, 1985 and entitled "Statistical
Analysis System For Use With Public Communication
15   Facility", now abandoned.

Background and Summary of the Invention

      Over the past several years, substantial
expansion has occurred in the technology of combining
20   telephonic and computer systems. For example, tele-
phone systems have been developed to readily transmit
digital data. Various forms of modems are in wide-
spread use to intercouple telephones and computers.
However, at a more personal level, it also has been
25   proposed to utilize the traditional dialing buttons of
telephone instruments to provide digital data, as for
various processing. In accordance with such arrange-

ments, voice messages prompt callers to provide data by actuating the alphanumeric buttons of conventional telephones. These systems have been proposed in association with computers to provide various services and one such system is disclosed in United States Patent No. 4,792,968, issued December 20, 1988, to Ronald A. Katz from an Application Serial No. 018,244 filed February 24, 1987.

With respect to telephonic-computer systems, attaining the interface format desired by an individual caller is sometimes complex and burdensome. Specifically, callers may be misdirected, screening may be ineffective and delays may be cumbersome. Also, records may be poor or non-existent. Furthermore, some situations exist where interface to a live operator is an important alternative. As a consequence, a need exists for an improved interface system for selectively interfacing a considerable number of individual callers with a multiple format processor, as to attain efficient and economical digital and vocal exchanges along with prompting and data accumulation.

In general, the present invention comprises a telephonic-computer interface system accommodating digital and vocal (analog) telephonic communication and capable of handling a large number of calls to selectively interface prompted live-operator stations or formats in a computer processor. The selected interface is controlled, as by call (called number, calling number, etc.) and can be altered under control of an operator, developed data or operating conditions. Accordingly, the system of the present invention interfaces: (1) a telephonic communication facility including remote terminals for individual callers, e.g. conventional telephone instruments including voice communication means, and digital input means in the

form of alphanumeric buttons for providing data and
(2) either a prompted live-operator station or a
multiple port, multiple format data processor for con-
currently processing data from a substantial number of
5   callers with respect to any of several formats.

The interface system incorporates a con-
troller for receiving calls from remote terminals for
association with ports in the telephonic computer
apparatus, and which receives signal-represented call
10   data (representing "calling" and "called" telephone
numbers) along with equipment information. An index
apparatus is controlled, as by the signal-represented
call data, to select initially a live-operator or
machine format of the processor so as to specify any
15   conditions for the interface, at least one of the
formats including at least one condition. A test
apparatus may determine whether or not an individual
call attains specified conditions and thereby controls
switching structure for providing the actual interface.
20   If a live-operator terminal is selected, or indicated as
a secondary format, prompt data is provided to a select
station. Data is recorded and processing procedures
also may be controlled by call data.

25   Brief Description of the Drawings
In the drawings, which constitute a part of
this specification, an exemplary embodiment exhibiting
various objectives and features hereof is set forth,
specifically:
30   FIGURE 1 is a block diagram of a system con-
structed in accordance with the present invention;
FIGURE 2 is a flow diagram illustrating the
operating process of the system of FIGURE 1;
FIGURE 3 is a block diagram of a component
35   portion of the system of FIGURE 1;

FIGURE 4 is a diagrammatic representation of a binary control word as registered and utilized in the system of FIGURE 1;

FIGURE 5 is a diagrammatic representation of a binary data record word as utilized and recorded in the system of FIGURE 1; and

FIGURE 6 is a flow diagram illustrating the operating process of the structure represented in FIGURE 5.

Description of the Illustrative Embodiment

As required, a detailed illustrative embodiment of the present invention is disclosed herein. However, physical communication systems, data formats, and operating structures in accordance with the present invention may be embodied in a wide variety of forms, some of which may be quite different from those of the disclosed embodiment. Consequently, the specific structural and functional details disclosed herein are merely representative; yet in that regard, they are deemed to afford the best embodiment for purposes of disclosure and to provide a basis for the claims herein which define the scope of the present invention.

Referring initially to FIGURE 1, a series of remote terminals T1-Tn (telephone instruments) are represented (left). The terminals T1-Tn are generally similar and accordingly only the terminal T1 is shown in any detail. The indicated terminals T1-Tn represent the multitude of telephone terminals existing in association with a communication facility CO which may comprise a comprehensive public telephone network.

The communication facility CO, along with the individual terminals T1-Tn, is coupled to a central processing station CS generally indicated by a dashed-line block. Generally with regard to the station CS,

individual terminals T1-Tn are interfaced either with a processor P (upper right) or one of several live-operator stations OS1-OSn (lower left) through a call receiver unit CU and a switch SW. Essentially, the

5 processor P and the switch SW cooperate (line 9) to control interfaces, with the processor P providing interface formats either (or both) to automate an interface or prompt a live operator at a station OS1-OSn. Note that the interface formats are stored as

10 described below in the processor P.

In accordance herewith, individual telephone calls are preliminarily processed on the basis of signal-represented call data to identify a specific operating format for a station or the processor P. The

15 preliminary processing may invoke screening tests to impose conditions or establish a test criteria for the switch SW to determine the acceptability of the call to interface with a specific operating format.

Calls are selectively processed according to a

20 specific operating format as indicated by call data. At any instant of time, the collective interface may involve several thousand calls simultaneously being processed through ports of the processor P. Exemplary selected formats of the processor might include: public

25 polls, lotteries, auctions, promotions, sales operations and games. Accordingly, the stations OS1-OSn may comprise a substantial number and the processor P may take the form of a sizable computer capable of simul-taneously processing many calls involving several

30 different formats. Although numerous possible confi-gurations are available, for purposes of explanation, the processor P is illustrated simply as a block with multiple ports. Note that while the switch SW and the processor P may be integrated in a single system, they

are separately illustrated to isolate the detailed structure and process of the present invention.

Input lines LI1 through LIn from the call receiver unit CU enter the switch SW to provide calling data and communication paths. Output lines LO1 through LOn function between the switch SW and the processor P as lines LS1-LSn operate to serve the stations OS1-OSn. Note that various multiplexing techniques are well known in the telephonic art to communicate call data and may be employed in the system.

Considering the system somewhat summarily, individual calls originating at the terminals T1-Tn are coupled through the communication facility CO and the call receiver unit CU to the switch SW. Call data, representative of calls, actuates the switch SW to preliminarily process each call based on the desired format. For example, depending on the desired format (indicated by the called number and/or the equipment data signals) calls are selectively coupled and process-ed. Furthermore, record data is assembled for storage.

Considering the system of FIGURE 1 in somewhat greater detail, the exemplary telephone terminal T1 includes a handpiece 10 (microphone and earphone) and a panel 12 provided with a rectangular array of push buttons 14 in a conventional configuration. Of course, the handpiece 10 accommodates analog signals while the panel 12 is a digital apparatus. Generally, the handpiece 10 serves to manifest analog or voice signals to a caller.

In accordance with conventional telephone structure, alphabetic and numeric designations are pro-vided on the buttons 14. For example, several of the buttons 14 carry three letters along with a decimal digit. Specifically, the button designated with the numeral "2" also carries the letters "A", "B" and "C".

Thus, the buttons 14 encompass the numerals "0-9" two symbols, and the alphabet except for the letters "Q" and "Z". Consequently, the buttons 14 substantially accommodate the entry of decimal and alphabetic data.

5   At this stage, some specific aspects of the communication facility CO are noteworthy. Essentially, with telephonic dialing, the communication facility CO couples selective terminals (from the multitude of terminals T1-Tn) to the call receiver unit CU. In that

10   regard, the unit CU at the central station CS may be reached by any of a plurality of called numbers. For example, the call unit CU might be reached by any of twenty telephone dialing numbers, each associated with a specific operating format of the processor P. One

15   called number or set of numbers might be associated with an auction format of the processor P. Another number or set of numbers might be associated with sales operating formats. Still another called number or set of numbers might identify a game format, and so on.

20   Incoming calls to the call receiver unit CU are identified by call data in accordance with telephone system techniques. As described below, the call data may specifically include digital signals representative of the called number (DNIS), the calling number

25   (ANI) (terminal number), and the terminal equipment.

In addition to attaining a preliminary interface with a selected format, individual calls may be screened based on the called number (identifying an operating format) and the calling number (caller iden-

30   tification) or the equipment. That is, the system of the present invention is based on a realization that signal-represented call·data can be effectively utilized to selectively interface individual callers at remote terminals with specific operating formats of a data

35   processor.

Considering the call data in somewhat greater detail, in accordance with current telephone systems, the communication facility CO may provide signal-represented call data for: the "called" number, the

5   "calling" number, and the equipment involved, e.g. "pulse" or "tone" terminal. Specifically, operating telephone equipment termed "DNIS" automatically provides the called telephone number in digital form from the communication facility CO. Somewhat similarly, existing

10   telephonic equipment designated "ANI" automatically indicates the caller's (calling) number in digital signal represented form. Generally, time shared lines carry such call data and also may provide call data indicating equipment. Thus, the call unit CU may

15   receive the called number, the calling number, and a calling equipment designation (pulse or tone), collectively termed call data, which data is utilized to establish control functions, as for example to select an operating format for a station OS1-OSn or the processor

20   P.

As described in detail below, call data is registered in the switch SW to perform distinct control operations. Specifically, a selection section 16 of the switch SW identifies a specific desired format for the

25   stations OS1-OSn or the processor P. Depending on the format, a testing section 18 of the switch SW may screen calls for interface connections.

Recognizing that the possibilities are great, formats for calls in accordance with the disclosed

30   embodiment may be of three different classes. Specifically, call formats may specify any of the following operations:

1. couple to live operator station if

35   possible or in accordance with a predeter-

mined criteria; if no operator station avail-
able, couple to processor;

   2. interface to processor;

   3. either above format, but selec-
tively re-couple to live operator station or
processor depending on secondary conditions.

   The ramifications of individual formats within
the above classes may vary considerably; however, some
examples will illustrate possibilities. A marketing
format (class 1) might interface callers to a live
operator if an operator is available. Upon receiving a
call, the operator station OS1-OSn (FIGURE 1) also
receives and displays prompting format data for the
attending operator. If an operator is not available
(all stations OS1-OSn busy) the system provides an
interface with the processor P and a format as to record
the data for a return call by an operator. Alterna-
tively, the processor completes the transaction with
data provided by the caller that may be digital, digital
and voice, or voice.

   In a game format, say of class 2, a caller may
be limited to interface the processor P. the interface
may be contingent on initial test conditions, e.g. call
data, caller record, time, etc.

   Formats of class 3 involve a switch between
live operator and processor depending on secondary
conditions. For example, a polling format may switch
from the processor P to an operator station OS1-OSn if
the caller fails to provide digital data in a respon-
sive form. Alternatively, an operator may command a
switch to the processor P upon identifying a specific
caller from whom data is to be taken.

   In the illustrative system of FIGURE 1, an
operating process is executed as illustrated in FIGURE

2.   Each incoming call prompts a preliminary query as indicated by a block 20 concerning the availability of a line or port.   In the absence of an available line, a busy signal is provided as indicated by the block 22.

5   Alternatively, an available line results in a preliminary interconnect as indicated by a block 24 setting a conditional connection into operation.

As indicated by a block 26, during the screening or testing interval (typically measured in

10   seconds or fractions of seconds) the caller remains on line and may receive a message.   That is, the caller might hear silence or may continue to hear the traditional telephonic ringing sound.   Alternatively, the caller might be given a brief vocal message to "stand

15   by" as indicated by the block 26.   In any event, the caller is held "on line" while the process continues.

With a call on a line, the communication facility CO (FIGURE 1) provides signal-represented call data, e.g. the called number, the calling number, and

20   the equipment designation.   As indicated by block 28 (FIGURE 2) signals representative of the call data are captured to perform preliminary control and processing operations as will now be considered.   Note that the selected formats will fall within one of the classes as

25   stated above.

The initial test is illustrated by a query block 25 representing an operation to distinguish calls of class 1 (operator) and class 2 (processor).   Calls for a format seeking an operator prompt a "yes" response

30   from the block 25 and proceed to the test of a block 27, "is an operator available?"   A "yes" determination advances the process to an operation indicated by a block 29.   Specifically, the block 29 represents the operations of coupling a caller to an operator station

35   and transferring the appropriate format data to the

station for prompting the operator. If no operator is available (block 27) the process proceeds with automated control to attain an interface in accordance with an appropriate format. Specifically, a control word is

5 fetched (block 36) to establish an operating format for interfacing the call. In that regard, the specified format may be very simple. For example, the call simply may be prompted to indicate identification for a return call. Alternatively, the format may incorporate condi-

10 tions or other complications as explained below.

Returning to the query block 25, if the call is to be coupled to the processor, an initial test operation is indicated by a block 30. A validity test is performed, for example, a list of calling numbers may

15 be compiled that are to be denied access to any interface with the processor P. Negative calling numbers may result either by the choice of the person responsible for the calling number terminal, or by the choice of the service operating the processor P (FIGURE 1). For

20 example, an accumulation of prior improper transactions from a terminal designated by a specific telephone number may provide a basis for complete disqualification. Equipment also may disqualify.

Recognizing that various circumstances may be

25 involved with respect to the total disqualification of a calling terminal, in accordance herewith the test involves formulation of a validity bit as indicated by the query block 30. Acceptable calls set the validity bit at a binary "1".

30 If the calling terminal is invalid, ("no" from the block 30) the call is rejected as indicated by the block 32 with or without a message and the line is released as indicated by the block 34. Note that the time interval involved is very short and the rejection

message may take various forms including a verbal
comment, a busy signal or simply a disconnected signal.

If a positive validity bit ("1") is formed at
the junction of the query block 30, a control word is
5   fetched under command of the called number as indicated
by the block 36. As described in detail below, a
control word is available for each operating format of
the processor P and is utilized to impose the condi-
tions for an interface and the terms of any associated
10   billing.

As indicated in FIGURE 2, the fetched control
word of the block 36 prompts an inquiry as to the condi-
tions attendant the selected operating format as indi-
cated by a query block 38. That is, in the process, the
15   query of block 38 determines whether further conditions
are imposed for attaining interface with the processor
P. If no further conditions are imposed, the format is
initiated by pursuing the connected interface as indi-
cated by a block 40. Also, as indicated by a block 42,
20   the call is logged or recorded as with respect to
billing data for example.

If access to a format involves conditions
("yes" from the query block 38), tests are specified as
illustrated by a block 44. That is, conditions for the
25   interface are specified by the block 44. Of course, the
specific tests may involve various criteria; however, in
the illustrative embodiment, the conditions involve
time, history and demographics. Each exemplary condi-
tion will now be considered somewhat preliminarily.

30   In the disclosed embodiment, time tests
involve testing the time of the call against certain
limitations. For example, it may be desirable to limit
some formats to specific time intervals as in relation
to a television broadcast, a real time auction and so
35   on. Note that the time tests also may be related to

specific terminal control and geographic areas treated on the basis of telephone area codes. Specific examples will illustrate.

Assume an operating game format that propounds questions to a caller based on knowledge of a particular television program. The program may be broadcast at different times in different geographic areas, and as a consequence it may be desirable to limit calls interfacing the processor format depending on the area code of calling numbers. Accordingly, time tests may involve solely the instant time, or various combinations of time and call data. The specific test is determined as indicated by a block 46 (FIGURE 2) imposing detailed operating instructions for the format. The test results are then correlated as represented by a block 48.

As indicated above, in accordance with the described embodiment, another test involves a record as for example directed to the station identified by the calling number. As an example, the record might take the form of either a negative or a positive file (for an individual format). In that regard, all formats involving "pay to dial" (e.g. 976, 900 etc.) calls might be conditioned as a group. Generally, in the case of a negative file, certain numbers are recorded that are to be denied access to a particular operating format. In the case of a positive file, access to the operating format is available only to calling numbers listed in the file.

Considering exemplary implementations of the system, a negative file may be based on limited or restricted use (as in the case of a lottery) or prohibitive use (telephone terminal owner choice). Formats accessible on a "one-time only" basis also may be controlled by negative lists. Thus, an operating format may be inaccessible to a terminal, or may be accessible

a specified number of times during a specified interval, e.g. three accesses per week. The historical test is symbolized in FIGURE 2 by the query block 50 to conditionally actuate the related tests as indicated in the block 48. History limitations also may involve purely format limits. For example, a give-away or dial-free format may be limited to some predetermined number of calls for a period, e.g. ten thousand calls per day. Thus, limits can be imposed on the economic exposure of a format.

Moving from the historic considerations, demographic tests may be specified as in relation to the geographic area manifest by the area code of the calling number. To consider a specific example, a public opinion poll may be conducted in which a particular geographic balance is defined. In such an operating format, calls may be accepted only until particular quotas are attained with respect to specified area codes. Such tests in the process are indicated by the query block 52, again to instruct the correlation block 48.

With the requisite tests established by selection of a format, the block 48 indicates resolving the acceptability of the call for the selected interface format. If the call is accepted, the process moves to initiate the selected format interface as indicated by the block 40. Conversely, if the call is to be rejected, the process moves to the step indicated by block 32, i.e. reject the call as with a message and release the line.

If a call is accepted, as represented by the block 40, there is a possibility that an established format may be aborted in favor of a different format. For example, interfacing the processor P, a qualified caller may fail to communicate digitally with the result

that transfer to a live operator is commanded. Also, in certain situations, a connection to a live operator is to be terminated in favor of an interface to the processor. In either event, an existing format is terminated in favor of a fresh format. That phase of the process is illustrated by an "abort" line from the block 40 returning to the block 28. Thus, the process returns to re-assign the caller to a new format in accordance with fresh data. Thus, transfers according to class 3 operation are implemented along with the other classes of operation by the switch SW (FIGURE 1).

An exemplary detailed structure of the switch SW (FIGURE 1) for executing the process of FIGURE 2 is represented in FIGURE 3. In that regard, individual telephone calls are manifest from the call receiver unit CU (FIGURE 1) comprising existing equipment as well known in the prior art. The call data is supplied through a line 60, upper left, FIGURE 3. Note that the represented single line 60 is merely symbolic of a channel to carry call data and provide direct telephone communication.

Generally, the system of FIGURE 3 illustrates elements of the switch SW of FIGURE 1 for processing an individual call. As indicated above, the system of the present invention involves the simultaneous processing of many calls with the possibility that numerous calls are simultaneously being tested for a connection as explained above. Consequently, although the system of FIGURE 3 is illustrated with respect to testing a single call, it is to be understood that sequential or parallel operations and multiplexing techniques, as well known and widely practiced in the computer field, are utilized to accomplish multiple processing operations as are described below with reference to FIGURE 3.

The line 60 (FIGURE 3, upper left) enters a line capture unit 62 through which signal-represented call data is supplied to a call data register 64. Accordingly, the call data is registered to be available for processing operations as explained generally with reference to FIGURE 2.

The line capture unit 62 also is connected to a control unit 66. Structurally, the control unit 66 may take the form of various computer facilities incorporating memory and logic capability to sequence and control specific functions as explained below. Generally, the control unit 66 implements specific formats which may involve coupling a caller either to a live operator station OS1-OSn or to the processor P. In that regard, the control unit 66 provides a series of timing signals t1-t6 to sequence the operations of individual component blocks as illustrated. Note that to preserve clarity in FIGURE 1, connections of timing signals t1-t6 are not illustrated. Also, the control unit 66 is connected to the operator stations OS1-OSn (line 67) to receive signals indicative of the availability of stations.

In addition to logic for controlled switching as described, the control unit 66 specifically includes a call register 68, a control register 70 and test control logic 72. The control register 70 receives format control words specified, as by the called number and having a form as illustrated in FIGURE 4.

Recapitulating, each of the operating formats has a control word for defining any access conditions or limitations to accomplish a specific format, e.g. connection to an operator station OS1-OSn or to the processor P (FIGURE 1). The formats may vary considerably; however, a few examples are the following:

Class 1, connect the live operator if available and provide prompt data for the XYS Company telemarketing program, if operator not available, cue caller: "All operators are busy at the moment, but we will return your call as soon as possible. Please touch your telephone buttons '2' and '4' to identify yourself as twenty-four for the return call".

Class 2, couple qualified callers to computer P for polling interface.

Class 3, couple callers to computer P for the RST Company telemarketing program, however, transfer to live operator (and prompt) if caller is not responsive.

These formats are established by control words that are selected on the basis of call data. The control words are sixteen bits, illustrated as the first sixteen bits (1-16) registered as shown in FIGURE 4. An additional group of registered bits (17-20) are provided from call data.

The initial three registered bits in the control register (FIGURE 4) serve as test command bits respectively for a time test, a history test and a demographics test. The presence of a "1" bit in any of the first three bit locations specifies the requirement for testing compliance to specified conditions. A "0" bit indicates no test.

The bits "4 through 7" in the control register constitute a field 74 and specify time conditions in relation to the instant time of the call. The field 74 may specify eight distinct time conditions. For exam-

ple, exemplary specified conditions for a format might
be as follows:

        Accept calls between 7:00 and 18:00,

5   Accept calls on Thursday between 9:00
and 10:00,

        Accept calls from area code 213 on
Wednesday between 15:00 and 16:00,

        Accept calls from area code 602 on

10   Wednesday between 16:00 and 17:00.

        Essentially, the time condition field 74
(activated by the time bit "1" - first bit position)
defines specific intervals during which calls will be

15   accepted for the specific called number and may be fur-
ther limited by the area codes. A wide range of possi-
bilities are available to accommodate specific programs
for individual formats.

        A field 76 in the control register embraces

20   bits "8" and "9" and defines the conditions for access
to the format based on historical considerations. Thus,
two bits are provided to indicate four possible histor-
ical limitations. Again, the test is specified by a "1"
bit, in this instance in the second bit location of the

25   register 70. The following limitations are exemplary of
many possibilities as related to a single telephone
number:

        Accept one call per day (per caller),

30   Accept one call per week (per caller),
        Accept one call per month (per caller),
        Accept one call during any three-
day period (per caller),
        Accept only 10,000 calls (per format).

35

Continuing with respect to the contents of the
register 70, as illustrated in FIGURE 4, bits "10" and
"11" constitute a field 78 specifying demographic test
limitations. Again, a few examples will illustrate the
various possibilities:

       Accept calls only from area code 213,

       Accept calls from area codes 213, 818
and 619,

       Accept only 1,000 calls from area
code 213,

       Accept calls from area code 213 with
the prefix numerals 619.

Again, the demographic test is imposed only
upon the existence of a "1" bit, in this instance in the
third bit of the control word. As in the other cases,
specific possibilities are considerable.

The bits "12" through "16" of the control word
constitute a field 80 and designate a selection code for
the identified format. These five bits enable a sub-
stantial number of formats to be designated and coded
with respect to various classifications. For example,
calls of the class 1 specifying a desirable connection
to a live operator station OS1-OSn might be encoded in a
"000" decimal series, e.g. "001" indicates XYZ Company
telemarketing program, "034" indicates RST Company
program, and so on. Accordingly, a "0" in the most
significant digit specifies a live operator format.
Similarly, lottery formats might be encoded in a "100"
decimal series, e.g. "101, 102, 103 --- 110, 111, 112" -
-- and so on; auctions might be designated in a "200"
series, e.g.: "201, 202, --- ". By using decimal
equivalent coding formats for various categories,
exclusions may be concisely stated. For example, a

calling number may be excluded from all lottery opera-
ting formats simply by the specification of decimal
"100" in association with the calling number.

5   The data, as illustrated in FIGURE 4 is loaded
into the control register 70. Again, the first sixteen
bits comprise the format control word and are provided
from a look-up table 84 (FIGURE 3, right, central) upon
being addressed by call data from the register 64.

10 The last bits (bits 17-20) stored in the
control register 70 are provided from an equipment and
billing instruction index 86. That is, in response to
the signal-represented call data indicating the called
number and the equipment, the look-up table 84 and the
index 86 supply data for loading the control register as
15 indicated above.

While the control register 70 is loaded to
specify the operation of the system, the call register
68 in the control unit 66 receives signals for addi-
tional control and to formulate a record of the call.
20 Specifically, as represented in FIGURE 5, the contents
of the call register 68 includes an initial validity bit
88 for indicating that the called number is either on a
positive list or is not on a negative list. The deter-
mination of the validity bit for location 88 is made by
25 reference to a memory 90 (FIGURE 3, central) addressed
by the calling number.

While the calling number addresses data to
indicate a validity bit, specific format exclusions also
may be indicated as explained above with respect to
30 certain formats. For example, certain classifications
of formats or specific formats (as a lottery) may be
identified as inaccessible for certain telephone termi-
nals as identified by calling numbers. Other than
lottery formats, certain discretionary formats also may
35 initiate control to limit access. Accordingly, a field

89 in the call register 68 (FIGURE 5, bits "2" through "6") is provided from the memory 90, addressed by the calling number to specify format exclusions. That is, the calling number addresses the memory 90 to load the field 89 and specify limitations. Consider a few examples of format exclusions or limitations for a calling number:

> No lottery formats,
>
> One lottery format per week,
>
> Two lottery formats per month of
>
> total cost under $25.00,
>
> No auction sales,
>
> Auction sales only with caller
>
> entered code I.D. 763.

Again, it will be apparent that many possibilities exist in applying various coding techniques, the above merely being exemplary. Also, as indicated above, a format may be void of any limitations or restrictions. In that event, as explained above, a connection or interface is promptly commanded by the format code.

The bits "7" through "26" stored in the call register 68 (FIGURE 5) constitute a field 91 and indicate the time of a call. Signals representative of the instant time of a call to load the field 90 are provided from a time clock 92 (FIGURE 3, upper left). Signals from the time clock 92 may be in a Julian code and are provided to the call register 68 and also to a time test logic network 94 (lower left).

The last bits (27-30) in the register 68 are provided from the call data. The bits "27" and "28" indicate format billing data and comprise a field 82. Again, representations are coded; however, with respect to the field 82 information is derived from the called

number. For example, an "800" called number may indicate no billing with the representative code being stored in the field 82. As another possibility, a "976" prefix number, or "900" number, may indicate a specific charge in relation to the identified format.

The bits "29" and "30" comprise a field 83 and may actuate a special form of the selected format. In the disclosed embodiment, the field 83 registers call data, as to indicate that the calling terminal is a "pulse" (rotary dial) signal unit or a "tone" (touch) signal unit. In the instance of a rotary terminal, the format program may be modified to accommodate "pulse" signal operation or inject operator communication with a transfer to one of the stations OS1-OSn.

Recapitulating to some extent with regard to the composition of the call record word in the register 68 (FIGURE 5), the memory 90 (FIGURE 3) is addressed by calling number data to provide data for the validity bit location 88 and the format-exclusion field 89. The time of call is stored in the field 91 from the clock 92. The billing and equipment data are provided by the index 86 in response to "calling" data signals.

Another element of memory, specifically, a recent activity storage 98 (FIGURE 3, lower right) is separately illustrated for convenience of explanation. Essentially, the storage 98 receives words from the call register 63 to maintain a record of interface calls. The recent activity storage may periodically be purged to permanent storage if desired. Thus, the recent activity storage 98 accumulates an activity record of all interface participants with respect to specific formats and is utilized in the history test for determining that an instant calling terminal is within the specified historical limitations as provided from the memory 90.

The activity tests are performed by a history test logic network 100 (FIGURE 3, lower central). In a related context, the demographics test as explained in detail above is performed by a demographics test logic network 102. The results of the test logic networks are communicated to the test logic 72 in the control unit 66. As a consequence, a switch unit 105 is actuated to either operatively couple the line 60 into a port of the processor P (FIGURE 1) or reject the call. If a call is accepted for an interface, a signal is supplied from the test control logic 72 through a line 107 to the switch 105 during the interval of the timing signal T6. The signal in the line 107 also is supplied to a format address register 109 for addressing the processor P. The register 109 stores select data signals to address a specific operating format of the processor P.

Recapitulating to some extent, call data indicates an interface format of the·processor P (FIGURE 1) with associated limitations, conditions and billing provisions. Call data also indicates possible format limitations or conditions for a calling number. The system processes the data with respect to the conditions and limitations to selectively enable interface operations. Essentially, the call data specifies a format (processor or operator) and any conditions relating to the format. Representative data accordingly is provided from the look-up table 84 and the memory 90 to the control register 70 and the call register 68 respectfully. Preliminary conditions may or may not be involved; however, qualified calls for an operator involve tests of availability within the control unit 66 according to data received from the stations OS1-OSn (line 67). As a result, calls are either interfaced to an operator who receives a format prompt, or interfaced to the processor according to a specified format.

Thereafter, a shift may command a redetermination and a transfer as described in detail below.

In view of the above structural and logic description of the system of FIGURE 3, the process as described with respect to FIGURE 2 and the stored control word forms as described with respect to FIGURES 4 and 5, a comprehensive understanding of the described embodiment may now best be accomplished by assuming an exemplary call and treating the individual responsive steps. Accordingly, assume the occurrence of a call as manifest on the line 60 (FIGURE 3, upper left). Further, assume that the called number, "976 513 7777" designates a lottery format with limited access. Details of the limited access will be treated below.

Upon occurrence of the call, the line capture unit 62 seizes a line relationship and signals the control unit 66. Immediately, an interval of time signal t1 is initiated and the register 64 is loaded with the called number ("900 513 7777"), the calling number ("415 318 4444") and the equipment designation (tone or no tone). To the caller, the operations as now described involve an almost imperceptible delay.

During the following interval of timing signal t2, the call register 68 and the control register 70 are loaded as illustrated respectively in FIGURES 4 and 5. Specifically, the called number and equipment designation specify data to load the control register 70. The calling number ("415 318 4444") from the register 64, prompts the memory 90 to load the validity bit 88 and the format exclusions in the field 89 of the register 68. Concurrently, the time clock 92 loads the field 91 with signals representative of the current time.

If the call register 68 does not receive a validity "1" bit, the calling number is indicated to be barred with a consequence that the line is released by

the control unit 66. In that regard, a voice generator
106 (FIGURE 3, left central) may be actuated by the
control unit 66 branching to the operation of timing
signal t6. Accordingly, a message of denial may be

5   provided on the line 60 prior to release of the line.
Note that the voice generator 106 may be variously used
to prompt or inform callers in certain preliminary
selection operations supplemental to the specific
operations disclosed below.

10   As indicated above, concurrently with the
loading of the call register 68 (timing signal t2), the
control register 70 also is loaded. Specifically, from
the register 64, the called number cues the look-up
table 84 to fill most of the control register (bits "1"

15   through "16", FIGURE 4). The fields 82 and 83 are
supplied from the index 86.

          That is, distinct from the fields loaded into
the control register 70 from the look-up table 84, the
fields 82 and 83 are supplied from the index 86. In

20   that regard, assume the called number (area code 976)
indicates that the charge for the service of the call
will be billed through the caller's telephone records.
Assume that the field 83 indicates a "tone" terminal
effective for a conventional digital interface.

25   At this point, some still further assumptions
will be made to pursue the explanation of the detailed
operations. Specifically, assume that the format
specified by the called number ("900 513 7777") is a
lottery format and includes limitations with respect to

30   time, history and demographics. Accordingly, the
initial three bits of the control word all will be "1"
bits in the control register 70.

          Assume further that the time conditions speci-
fied by the field 74 (FIGURE 4) limit calls from area

35   code 415 to days other than Sunday. Assume that the

history field 76 of the control word imposes a limita-
tion of one call per day per calling station. Assume
that the demographics field 78 excludes any call from
area codes "512", "412", "812", --- (not "415").

5   Finally, assume the selected format (field 80) desig-
nates a specific lottery format, that is lottery "128".

In addition to registration of the data sets
detailed above, because a history test is specified, the
recent history storage 98 is cued during the interval of

10   timing signal t3. The operation is through the memory
90 by the control unit 66 to prompt the supply of
historical data (previously registered record words) for
the telephone terminal designated by the calling number
("415 318 4444"). Specifically, during the interval of

15   timing signal t3, the storage 98 supplies data on the
calling number to the history test logic network 100.
Such data is compiled into a test format as to indicate
the number of calls per day, per week, and so on. Note
that aggregate call totals may also be supplied as a

20   test criteria. Thus, the control unit 66 coordinates
the test criteria data preparatory to the test opera-
tions of the individual logic networks 94, 100 and 102.

To summarize, in accordance with the above
assumptions, the test control logic 72 is set up to

25   coordinate the following specific logic tests:

Time limitation test by network 94:
accept calls from area code 415 except on
Sunday,

30   History limit test by network 100:
accept only one call per day per station,
Demographics test by network 102:
accept no calls from area codes 512, 412,
812 --- (415 not listed).

35

As explained above, in addition to the limitations specified, in relation to the format, further limitations may be specified by the calling number. Such limitations are specified by the field 89 in the register 68 (FIGURES 3 and 5). In the instant example, assume that according to the record word, participation in the lottery format is limited to the interval between 10:00 a.m. and 3:00 p.m., e.g. when minors are in school. The code for such a format is supplied during the interval of timing signal t3 from the field 89 of the call register 68 to further establish the set-up of the logic 94 acting through the test control logic 72.

Recapitulating with regard to the test control logic 72, essentially a program is defined imposing each of the limitations that are specified by the call data in sufficient detail that comparison tests are expediently performed by the networks 94, 100 and 102. It is stressed, as indicated above, that the tests are selectively performed only in the event a "1" bit appears in the representative first three bit locations of the control word format. In the illustrative example, all the tests were commanded and accordingly the test control logic 72 sets up the condition for tests to be performed by the networks 94, 100 and 102, all during the interval of timing signal t3. Of course, the specific example represents one possibility of a substantial number of programs that might be specified to the system.

With the test formats established in the test control logic 72, the logic networks 94, 100 and 102 are driven during the interval of test signal t4 to execute a program in accordance with the assumed example. The process may be variously implemented in logic using well known techniques and is detailed in FIGURE 6. Consider the time test of the network 94. The time test logic

network 94 approves an interface only if: the call is
not from area code "415" on a Sunday and furthermore the
call occurs between the hours of 10:00 a.m. and 3:00
p.m. As indicated in FIGURE 6, a decision block 120

5   resolves the area-code "415" time test. If the area
code is not "415", the logic proceeds to the next query
block 122. Alternatively, if the area code is "415",
the day must be tested against Sunday as indicated by
the query block 124. An affirmative indication from the

10   Sunday test of block 124 prompts a rejection as indi-
cated by the block 126.

If the Sunday test of block 124 is passed, the
program imposes another time test, that is the time-of-
day test as indicated by the block 122. Again, a

15   negative result prompts a rejection; however, a positive
result involves the next step as indicated by the block
128.

Note that the operations designated by query
blocks 120, 122 and 124 are performed by the time test

20   logic network 94 (FIGURE 3). The next test of the block
128 is performed by the history test logic 100. The
block 128 (FIGURE 6) involves a determination of whether
or not the instant call is the first for the calling
terminal on the instant calendar day. If not, the

25   limitations are exceeded and the call is rejected. If
the test is passed, the process next involves the
demographic test logic network 102 (FIGURE 3) to deter-
mine whether or not the call originated from an excluded
area based on the calling number area code.

30   Area controls are illustrated by the query
block 130 of FIGURE 6. Specifically, the demographics
test logic network 102 determines whether or not the
current call is from a denied area. If so, the call is
rejected as indicated by the block 126. Alternatively,

35   if the area is not excluded, as illustrated by the block

134 in FIGURE 6, the interface is accepted. In the
instant case, the area "415" is acceptable.

    In the operation of the system as illustrated
in FIGURE 3, the logic networks 94, 100 and 102 indicate
test results to the test control logic 72 during the
interval of the timing signal t5. The logic 72 corre-
lates the test result for action by the control unit 66.
If the imposed conditions are met (or if there are no
conditions) the control unit 66 actuates the switch unit
105 and the address register 109 through the line 107 to
perfect the interface from the line 60 (upper left) to
either a port in the processor P (FIGURE 1) or one of
the operator stations OS1-OSn. Essentially, the switch-
ing operation occurs during the interval of the timing
signal t6. Concurrently, the address register 109
specifies the select operating format as stored in the
processor P for direct use in an interface with a
caller, or to be retrieved and supplied through the
switch SW to prompt an operator at a station OS1-OSn.

    Also during the interval of the timing signal
t6, the contents of the call register 68 is stored in
the recent history storage 98. Note that billing data
is stored with the call words and may be selectively
extracted from the storage 98. At the termination of
the timing signal t6, the interface endures until there
is a "disconnect" or an "abort".

    If the processor P senses the existence of
conditions specifying a shift between a processor
interface and a live operator communication, the control
unit 66 is actuated as indicated through line 115. Note
that the abort signal is formed either in response to
predetermined conditions in an interface with the
processor P, or on command from an active operator
station. The signal is also supplied to the look-up
table 84 which becomes active if a transfer is condi-

tional. That is, if a transfer is conditional, the tests as described above may be invoked. Conversely, if the transfer is unconditional, the control unit 66 simply actuates the switch 105 to make the change and

5 prompts the format address register to establish the desired format or prompt pattern for an operator.

The formats may involve various records, however, in accordance with the system of the present invention affords considerable flexibility to program

10 individual conditions and limitations for each inter- face format based on the call data (calling number and called number). An interface may involve no conditions or conditions may be imposed from the called number (format selection), the calling number, or both.

15 Accordingly, effective control may be imposed depending upon the service requested as manifest by an individual format, the instant time, the history of use and the demographics involved. The imposed limitations may be non-existent or may involve a relatively complex test

20 pattern as explained in detail above.

In the disclosed embodiment, an effective record of calls is accumulated in the recent history storage 98. Thus, a composite and detailed record is accumulated of individual calls as executed.

25 It is to be appreciated that numerous formats may be implemented and controlled utilizing the prin- ciples of the system as illustrated above. Accord- ingly, it is to be understood that the system of the present invention should be interpreted in accordance

30 with the claims as set forth below.

WHAT IS CLAIMED IS:

A-2

1.   An interface control system for use with, (1) a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument includ-ing voice communication means and digital input means for providing data, (2) a multiple port, multiple format processor for interfacing a substantial number of callers in any of a plurality of formats to concur-rently process data, and (3) a plurality of live opera-tor stations with prompting capability, for a plurality of formats, said interface control system comprising:

call data means for receiving signal-represented call data from said terminals;

selection means for selecting one of said formats under control of said call data means to thereby further specify any defined conditions for a connection of a call either to said multiple port, multiple format processor or one of said live operator stations, at least one of said formats having at least one specified condition; and

interconnect switch means for providing format data and controlling connections from a calling remote terminal to a port of said multiple port, multiple format processor or one of said live operator stations under control of said selection means.

2.   A system according to claim 1 further including test means to specify test conditions for certain of said formats and means to test compliance with said conditions to further control said intercon-nect switch means.

1   3. A system according to claim 2 wherein one
2 of said test means comprises means for executing a test
3 based on the time of a call.

1   4. A system according to claim 2 wherein one
2 of said test means comprises means for executing a test
3 based on the history of the calling remote terminal.

1   5. A system according to claim 2 wherein one
2 of said test means comprises means for executing a test
3 based on the demographics of the calling remote termi-
4 nal.

1   6. A system according to claim 1 wherein said
2 selection means includes a look-up table for specifying
3 said formats addressed by call data.

1   7. A system according to claim 1 wherein said
2 selection means includes a control storage location and
3 means for setting control data in said control storage
4 location responsive to said call data.

1   8. A system according to claim 1 further
2 including a voice generator means for prompting a
3 caller.

1   9. A system according to claim 1 further
2 including means for storing data representative of
3 calls.

1   10. A system according to claim 9 wherein
2 said means for storing includes means for storing
3 billing data.

1   11. A system according to claim 1 further

2   including means to provide an abort signal, the system

3   being responsive to said abort signal to reactuate said

4   interconnect switch means for providing alternative

5   connections with format data.

1   12. A system according to claim 11 further

2   including test means to specify test conditions for

3   certain of said formats and means to test compliance

4   with said conditions to further control said intercon-

5   nect switch means.

1   13. A system according to claim 1 wherein

2   said selection means selects under control of DNIS

3   signals.

1   14. A system according to claim 1 wherein

2   said selection means selects under control of ANI

3   signals.

1   15. A system according to claim 1 wherein

2   said selection means selects under control of equipment

3   type signals.

1   16. An interface control system for use with,

2   (1) a communication facility including remote terminals

3   for individual callers, wherein said remote terminals

4   may comprise a conventional telephone instrument includ-

5   ing voice communication means and digital input means

6   for providing data, (2) a multiple port, multiple format

7   processor for interfacing a substantial number of

8   callers in any of a plurality of formats to concur-

9   rently process data, and (3) a plurality of live opera-

10   tor stations with prompting capability, for a plurality

11   of formats, said interface control system comprising:

```
12              call data means for receiving signal-
13   represented call data from said terminals;
14              selection means for selecting one of said
15   formats under control of said call data means to thereby
16   further specify any defined conditions for a connection
17   of a call either to said multiple port, multiple format
18   processor or one of said live operator stations, at
19   least one of said formats having at least one specified
20   condition;
21              test means for testing the specified condi-
22   tions to provide approval signals; and
23              interconnect switch means for providing
24   connections from a calling remote terminal to a port of
25   said multiple port, multiple format processor or one of
26   said live operator stations under control of said
27   selection means and conditional, in conditioned formats,
28   on an approval signal from said test means under control
29   of said approval signals from said test means.

1               17.  A process for interfacing a telephonic
2    communication system including remote terminals either
3    with a multiple port, multiple format data processing
4    system, said multiple port, multiple format data proces-
5    sing system for concurrently processing data from said
6    remote terminals according to a plurality of formats, at
7    least one of said formats having at least one condition
8    for a calling terminal, or one of a plurality of opera-
9    tor stations with prompting capability for a plurality
10   of formats, and wherein said telephonic communication
11   system provides call data signals, as to indicate called
12   and calling numbers, said process including the steps
13   of:
14              receiving said call data signals from said
15   telephonic communication system for a calling remote
16   terminal;
```

17   selecting a processing format either for said
18 multiple port, multiple format processing system or one
19 of said plurality of operator stations for the calling
20 remote terminal under control of said data signals as
21 the selected format;
22   testing the selected format in relation to
23 said call data signals; and
24   conditionally interfacing said selected format
25 to a calling terminal under control of said testing of
26 call data signals.

MULTIPLE FORMAT TELEPHONIC
INTERFACE CONTROL SYSTEM

Abstract of the Disclosure

5   Call data signals actuated by a telephone
terminal are provided from a telephone communication
system to indicate call data as the called number, the
calling number and the calling equipment. The call data
signals address related control functions for selec-
10   tively interfacing a live operator terminal or a
multiple format multiple port data processing system.
The interface connection involves providing a specific
format as for automated processing or to prompt an
operator. Screening tests and format selection are
15   performed to make a determination. Individual telephone
terminals and individual data formats are arranged and
interfaced under controlled conditions specified by the
call data. Time tests, history tests and demographic
tests may be executed in addition to basic selection and
20   qualification tests. Control may be executed from
active data storage for assembled control words and
record words. Record words for individual calls may be
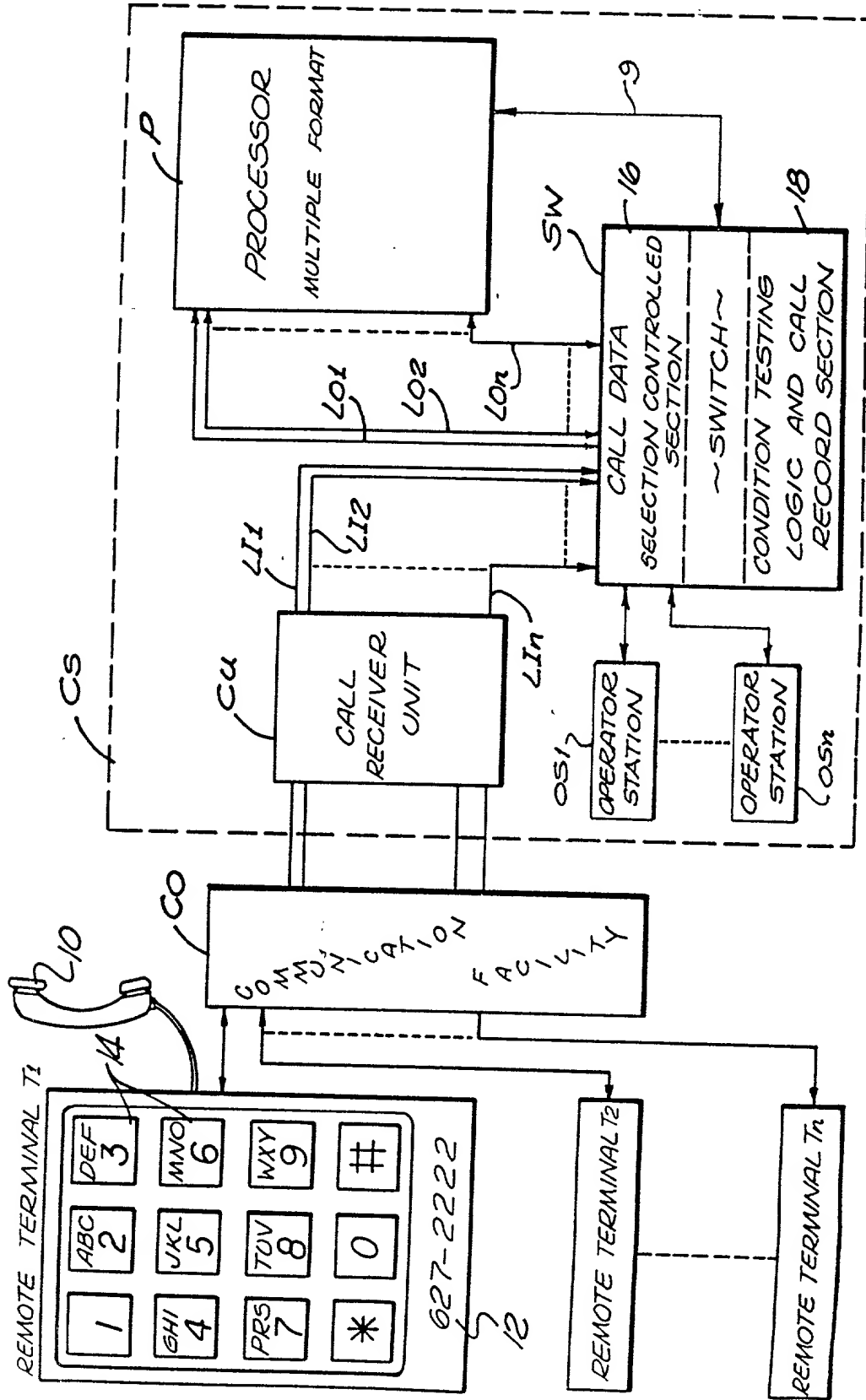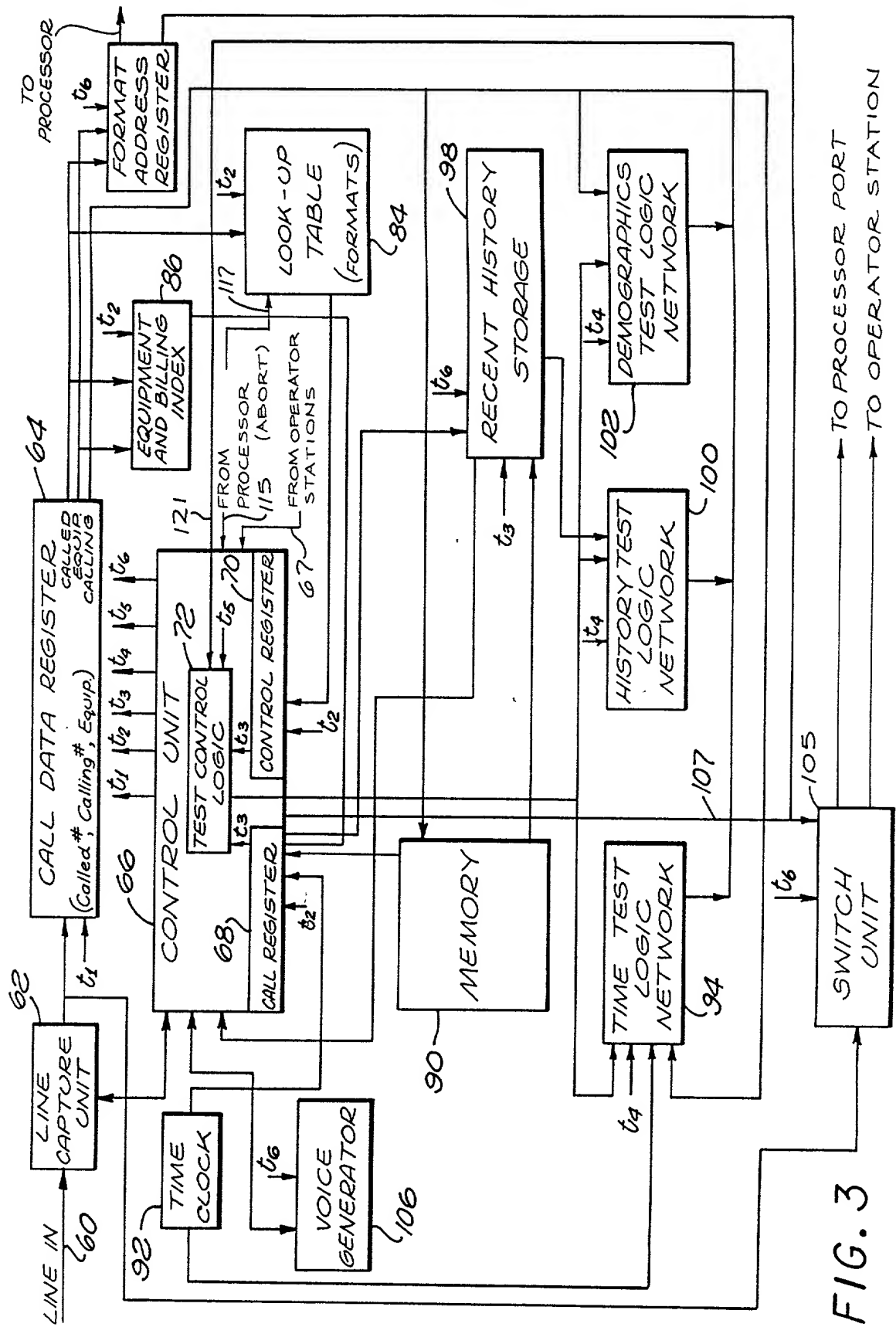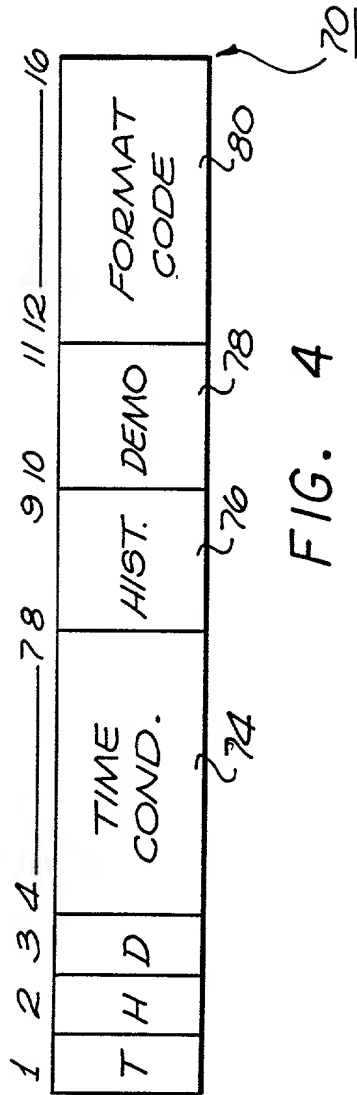stored along with developed data.

25

FIG. 1

FIG. 2

INCOMING CALL

20 LINE AVAILABLE ? — YES → **24** INTERCONNECT

— NO → **22** BUSY SIGNAL

26 PROVIDE DELAY MSG (Voice Generator)

28 FETCH CALL DATA Called#, Calling#, Equip.

25 OPERATOR CALL ? — NO / YES

27 OPERATOR AVAILABLE ? — NO / YES

29 TRANSFER CALL & DATA TO OPERATOR

44 SET TEST CONDITIONS

30 VALIDITY BIT CHECK ? — NO / YES

36 FETCH CONTROL WORD

46 TIME TEST OK ? — YES / NO

50 HISTORY TEST OK ? — YES / NO

52 DEMO TEST OK ? — YES / NO

38 CONDITIONAL FORMAT ? — NO / YES

ABORT

32 REJECT MSG

40 INITIATE FORMAT

34 RELEASE LINE

42 LOG CALL (Billing Data)

48 CORRELATE TESTS — YES / NO

FIG. 3

1	2	3	4	78		9 10	11 12	16
T	H	D	TIME COND.		HIST.	DEMO	FORMAT CODE	

74 76 78 80

70

FIG. 4

1	2		67		26 27	28 29	30
√	FORMAT EXCLUSIONS		CALL UNIT		BILL	EQUIP.	

88 89 91 82 83

68

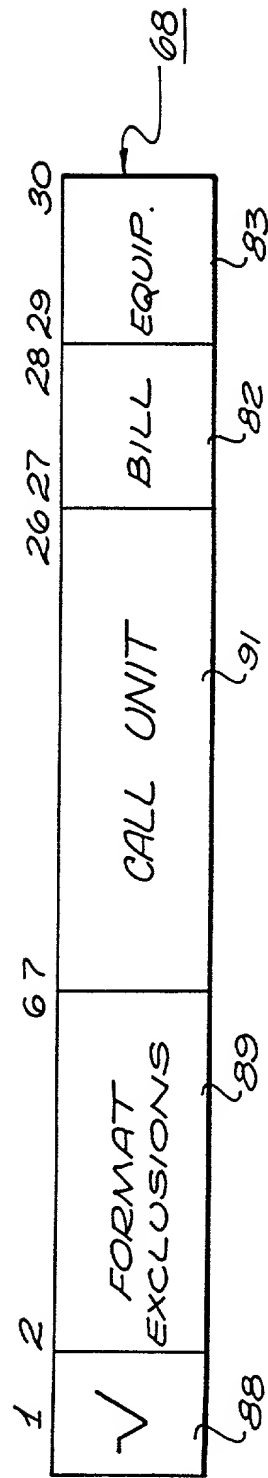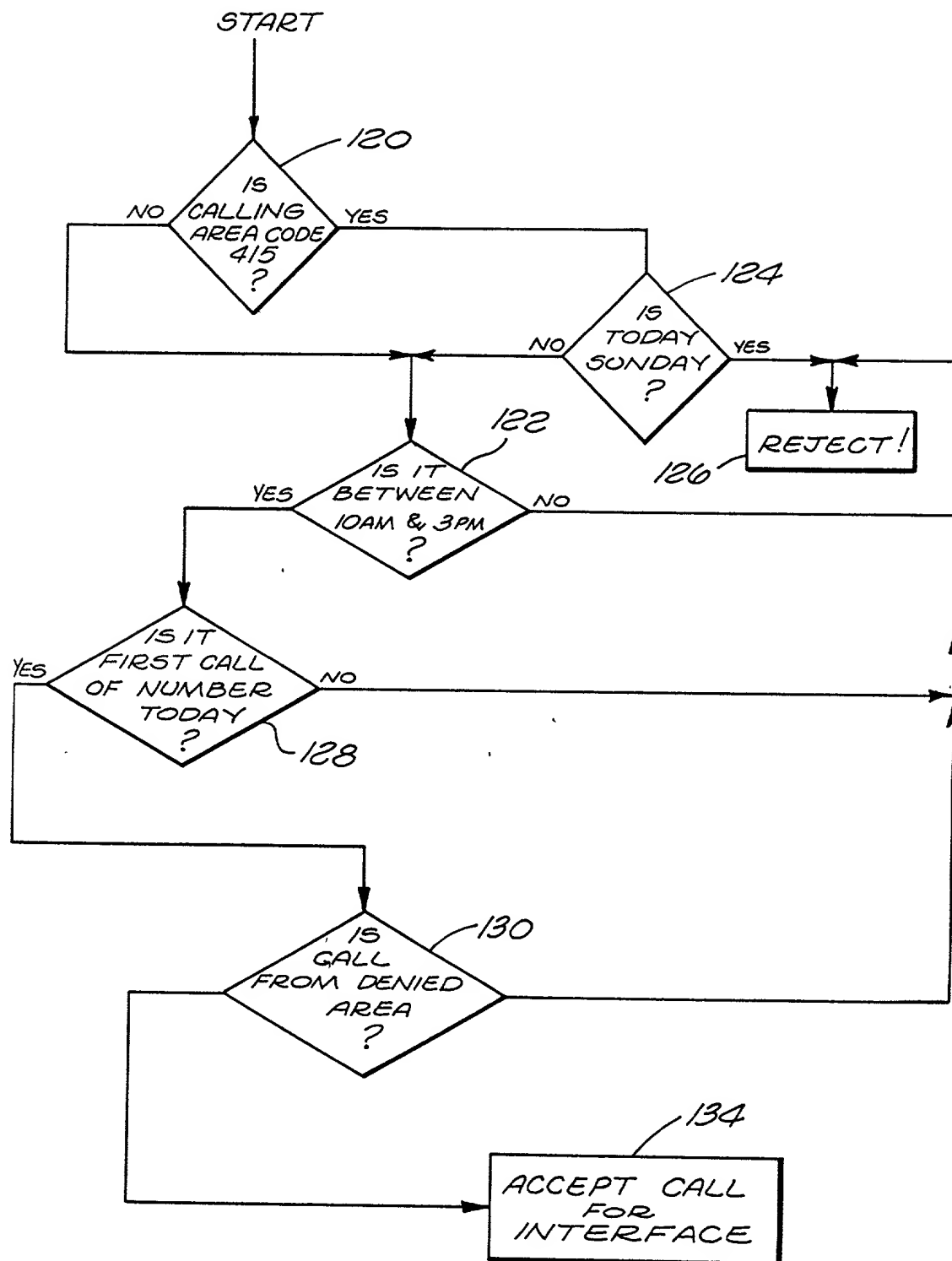## FIG. 5

START

FIG. 6

DECLARATION AND PETITION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled MULTIPLE FORMAT TELEPHONIC INTERFACE CONTROL SYSTEM, the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed: None.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37,
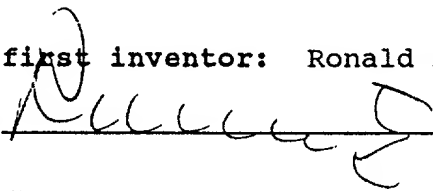
Code of Federal Regulations, § 1.56(a) which occurred
between the filing date of the prior application and the
national or PCT international filing date of this
application:

260,104	October 20, 1988	Pending
Application Serial No.	Filing Date	Status

4,792,968	December 20, 1988	
Patent No.	Issued	

753,299	July 10, 1985	Abandoned
Application Serial No.	Filing Date	Status

    I hereby declare that all statements made
herein of my own knowledge are true and that all state-
ments made on information and belief are believed to be
true; and further that these statements were made with
the knowledge that willful false statements and the like
so made are punishable by fine or imprisonment, or both,
under Section 1001 of Title 18 of the United States Code
and that such willful false statements may jeopardize
the validity of the application or any patent issued
thereon.

    Wherefore I pray that Letters Patent be
granted to me for the invention or discovery described
and claimed in the foregoing specification and claims,
and I hereby subscribe my name to the foregoing specifi-
cation and claims, declaration and petition.

Full name of sole or first inventor: Ronald A. Katz

Inventor's signature: _____

Date: 4/3/90 _____

Residence: Los Angeles, California
Citizenship: U.S.A.
Post Office Address: 570 South Mapleton Drive
                     Los Angeles, California 90024

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	Group Art Unit: 2605
)	
Ronald A. Katz)	Examiner: S. Woo
)	
Serial No. 08/485,113)	
)	
Filed: June 7, 1995)	
)	
For: MULTIPLE FORMAT TELEPHONIC)	
INTERFACE CONTROL SYSTEM)	
)	
Dkt. No.: 228/040)	
(previous dkt. nos. 9002-1B671US4 and 6646-108N4))	
)	

REVOCATION AND GRANT OF POWER OF ATTORNEY

Assistant Commissioner for Patents
Washington, D.C.   20231

Sir:

All powers of attorney granted before are revoked.

I, Ronald A. Katz, am the president of A2D Corporation, a California corporation,

which corporation is a general partner of A2D, L.P. a California limited partnership,

which limited partnership is a general partner of RONALD A. KATZ TECHNOLOGY

LICENSING, L.P., a California limited partnership, the assignee owning all of the interest

in this application, and by virtue of the foregoing relationships I execute this document on

its behalf to appoint as its attorneys and representatives, with full powers of substitution

and revocation, to prosecute this application and to transact all business in the Patent and
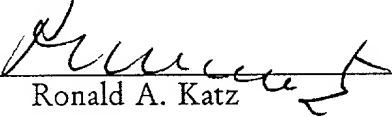
Trademark Office

connected with it, David B. Murphy, Reg. No. 31,125, and Reena Kuyper, Reg. No. 33,830

(registered patent agent); and

> Roland N. Smoot, Reg. No. 18,718; Conrad R. Solum, Jr., Reg. No. 20,467;
> James W. Geriak, Reg. No. 20,233; Robert M. Taylor, Jr., Reg. No. 19,848;
> Samuel B. Stone, Reg. No. 19,297; Douglas E. Olson, Reg. No. 22,798;
> Robert E. Lyon, Reg. No. 24,171; Robert C. Weiss, Reg. No. 24,939; Richard
> E. Lyon, Jr., Reg. No. 26,300; John D. McConaghy, Reg. No. 26,773;
> William C. Steffin, Reg. No. 26,811; Coe A. Bloomberg, Reg. No. 26,605; J.
> Donald McCarthy, Reg. No. 25,119; John M. Benassi, Reg. No. 27,483; James
> H. Shalek, Reg. No. 29,749; Allan W. Jansen, Reg. No. 29,395; Robert W.
> Dickerson, Reg. No. 29,914; Roy L. Anderson, Reg. No. 30,240; David
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> Olson, Reg No. 30,790; Steven D. Hemminger, Reg. No. 30,755; Jerrold B.
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> Reg. No. 31,653; Kenneth H. Ohriner, Reg. No. 31,646; Mary S. Consalvi,
> Reg. No. 32,212; Lois M. Kwasigroch, Reg. No. 35,579; Robert C.
> Laurenson, Reg. No. 34,206; Carol A. Schneider, Reg. No. 34,923; Hope E.
> Melville, Reg. No. 34,874; Michael J. Wise, Reg. No. 34,047; and Richard J.
> Warburg, Reg. No. 32,327;

all of LYON & LYON, First Interstate World Center, 633 West Fifth Street, Suite 4700,

Los Angeles, California 90071-2066, telephone: (213) 489-1600.

The Assignment of this application to RONALD A. KATZ TECHNOLOGY

LICENSING, L.P., was recorded on September 26, 1994, on Reel 7133, Frames 95-100.

Also, I have reviewed the assignment documents and hereby certify that, to the best

of my knowledge and belief, title to the subject matter of this application is with

RONALD A. KATZ TECHNOLOGY LICENSING, L.P.

Date: ___9/16/97___ By: _____
                         Ronald A. Katz
                         President
                         A2D Corporation

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POWER OF ATTORNEY BY ASSIGNEE

Commissioner of Patents
    and Trademarks
Washington, D. C. 20231

Sir:

I, Aldo Tesi, Executive Vice President of
FIRST DATA RESOURCES INC., a corporation of the State of
Delaware and assignee of the entire right, title and
interest in the application for United States Letters
Patent entitled MULTIPLE FORMAT TELEPHONIC INTERFACE
CONTROL SYSTEM and executed on April 3, 1990, with
inventor Ronald A. Katz, hereby appoint:

Attorney	Registration No.
Byard G. Nilsson	17,350
Billy A. Robbins	18,313
Lewis M. Dalgarn	20,415
Robert Berliner	20,121
M. John Carson	25,090
Harold E. Wurst	22,183
Michael S. Elkind	28,710
Gregory B. Wood	28,133
Robert A. Green	28,301
Mark E. Garscia	31,953
John P. Spitals	29,215
Jeffrey F. Craft	30,044
Georgann S. Grunebach	33,179

all attorneys of the law firm of Nilsson, Robbins,
Dalgarn, Berliner, Carson & Wurst, Fifth Floor, 201
North Figueroa Street, Los Angeles, California 90012-
2628, as attorneys of said corporation with full powers
of substitution and revocation to prosecute this appli-
cation and to transact all business in the United States
Patent and Trademark Office in connection therewith.

Please send all correspondence to:

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NILSSON, ROBBINS, DALGARN,
BERLINER, CARSON & WURST
201 North Figueroa Street, Fifth Floor
Los Angeles, California 90012-2628
U.S.A.

Telephone (213) 977-1001

FIRST DATA RESOURCES INC.

By: _____
Aldo Tesi
Executive Vice President

Attorney Docket No. 4646-108C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Ronald A. Katz	)
		)
Serial No.:	08/306,751	) Examiner in parent
		) case: S. Woo
Filed:	September 14, 1994	)
		) Art Unit: 2608
For:	MULTIPLE FORMAT TELEPHONIC	)
	INTERFACE CONTROL SYSTEM	)
		)
New Docket No.:	6646-108N3	)
(Previous Docket No.: 4646-108N3)		)

POWER OF ATTORNEY BY ASSIGNEE

Commissioner of Patents
    and Trademarks
Washington, D. C. 20231

Sir:

     I, Ronald A. Katz, am the President of A2D Corporation, a California corporation, which corporation is a general partner of A2D, L.P., a California limited partnership, which limited partnership is a general partner of RONALD A. KATZ TECHNOLOGY LICENSING, L.P., a California limited partnership and assignee of the entire right, title and interest in the application for United States Letters Patent entitled MULTIPLE FORMAT TELEPHONIC INTERFACE CONTROL SYSTEM, and am authorized to sign on its behalf.

     The Assignment of this application to RONALD A. KATZ TECHNOLOGY LICENSING, L.P., has been submitted to the Assignment Branch and was received on September 26, 1994.

     I have reviewed the foregoing document and hereby certify that, to the best of my knowledge and belief, title to the

subject matter of this patent application is in RONALD A. KATZ
TECHNOLOGY LICENSING, L.P.

I hereby appoint: Byard G. Nilsson, Reg. No. 17,350, Harold
E. Wurst, Reg. No. 22,183, Robert A. Green, Reg. No. 28,301, Anne
Wang, Reg. No. 36,045, all members of the bar of one or more
states, Reena Kuyper, Patent Agent, Reg. No. 33,830, all of the
law firm of Nilsson, Wurst & Green, 707 Wilshire Blvd., 32nd
Floor, Los Angeles, California 90017; and Thomas J. Lannon,
Registration No. 18,417, 105 Whittier St., NW, Washington, DC
20012, to prosecute this application and to transact all business
in the United States Patent and Trademark Office in connection
therewith.

Please send all correspondence to:
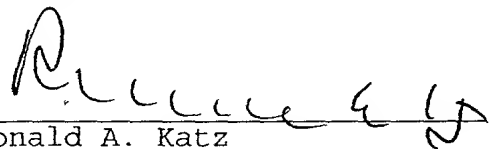
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                    LICENSING, L.P., a California limited
                    partnership,

                    By: A2D, L.P., a California limited
                    partnership, its general partner

                    By: A2D Corporation, a California
                    corporation, its general partner

         By: _____
                    Ronald A. Katz
                    President,
                    A2D Corporation

Attorney Docket No. 6646-108N3
6646\108N3.poa

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